UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Offic
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/373,272	08/12/99	AUSTIN-PHILLIPS	S 09820.1...

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INTELLECTUAL PROPERTY DEPARTMENT
DEWITT ROSS & STEVENS SC
FIRSTAR FINANCIAL CENTRE
8000 EXCELSIOR DRIVE SUITE 401
MADISON WI 53717-1914

EXAMINER	
EPPS,J	
ART UNIT	**PAPER NUMBER**
1635	5

DATE MAILED: 12/20/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application N . 09/373,272	Applicant(s) AUSTIN-PHILLIPS ET AL.	
	Examiner Janet L Epps	Art Unit 1635	

-- Th MAILING DATE of this communication appears on th cov r sh et with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *8/12/1999* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1 –26 are rejected under 35 U.S.C. 112-second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, 16, and those claims dependent therefrom, recite Markush groups containing the language "and combinations thereof". These claims appear to claim a Markush group without the proper use of the Markush format. Alternative expressions are permitted if they present no uncertainty or ambiguity with respect to the question of scope or clarity of the claims. The metes and bounds of this Markush group is indefinite because it is unclear if the members of this group are mutually exclusive. One acceptable form of alternative expression, which is commonly referred to as a Markush group, recites members as being "selected from the group consisting of A, B and C." See Ex parte Markush , 1925 C.D. 126 (Comm'r Pat. 1925).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 1-13, 15, and 21-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Van Ooyen et al.

The invention of Van Ooyen et al. comprises plants transformed with DNA constructs comprising genes capable of degrading plant polysaccharides and optionally containing additional genes encoding enzymes which are capable of further modifying the degradation products resulting from the first degradation step. The enzymes useful in this invention include those classified with enzyme classifications of EC 3.2.1.91, EC 3.2.1.21, EC 3.2.1.6, and EC 3.2.1.4 (col. 4, lines 22-36).

The DNA constructs of this invention include those that allow regulation of the expression of the enzyme(s) of interest with respect to expression level and spatial (tissue/ organ specific) and/or developmental regulation of expression. Additionally, these DNA constructs can be used to target the expression of said enzyme(s) to a particular locus, i.e. cellular compartment or organelle, to which the expression of the enzyme is desired so than an optimal effect, such as better access to the substrate, is obtained (col. 3, lines 39-61).

The enzyme(s) of interest may be expressed constitutively in the transgenic plants during all stages of development or in a stage-specific manner. Depending on the use, the enzymes may be expressed tissue-specifically, for instance in plant organs such as fruit, tubers, leaves, or seeds (col. 5, lines 14-21). Plants capable of being used in conjunction with the present invention include, but are not limited to crops producing tobacco and alfalfa (col. 5, lines 56-59). Additionally, these plants may be monocotyledenous or dicotyledenous (col. 7, lines 27-43).

This invention includes methods for generating transgenic plants in which more than one enzyme is expressed, this process may include successive transformations of plants, each time

using a DNA fragment or plasmid encoding a different enzyme of interest under the control of the necessary regulatory sequences (col. 8, lines 10-24).

Van Ooyen et al. teach each and every aspect of the instant invention thereby anticipating Applicant's claimed invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 14, 16-18, and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Ooyen et al. in view of Virki et al. (WO 9320714), Henrissat et al., and Willmitzer et al. (PTO-1449)

The discussion of Van Ooyen as set forth above is incorporated here. However, Van Ooyen does not teach genetically recombinant plants expressing *A. cellulolyticus* endoglucanase E1 or *T. reesei* CBH I, or *T. fusca* cellulase E2, *T. fusca* cellulase E3.

The prior art teaches the industrial use of cellulose degrading enzymes. For example Virki et al. (see entire document) teach the treatment of fibrous crops with a cellulase mixture as a means for improving feed values and improving the conservation or storage of fibrous crops. Some of the cellulases useful in the invention of Virki et al. include CBHI, CBHII, and EGI. Furthermore, the methods of Virki et al. can be used for enhancement of the nutritive value of forage for silage (page 3, line 34- page 4, line 35), and for the ensiling of low dry matter fibrous crops.

Henrissat et al. teach the synergism of cellulases, CBHI, CBHII, EGI and EGII from T. reesei in the degradation of cellulose (entire document, esp. page 722).

Moreover, Willmitzer et al. teach the expression of industrially useful enzymes in transgenic plants. The transgenic plants of this invention may be used for the production of industrial enzymes by cultivating a seed or other propagatable part thereof, and the enzyme may then be recovered from the plant (see entire document, esp. pp. 2, line 1-14).

It would have been obvious to one of ordinary skill in the art at the time of filing of the instant application to modify the teachings of Van Ooyen et al. with the teachings of Virki et al. Henrissat et al. and Willmitzer et al. in the formulation of the instant invention. It would have been obvious because the prior art clearly teaches the benefits of using cellulolytic enzymes in a variety of different industrial uses (i.e. in methods of ensilement, increasing the nutritive value of forage, and modifying the taste and texture of plants), additionally the prior art clearly teaches the use of transgenic plants in expressing industrially useful genes. Furthermore, it would have been obvious to use the cellulases of Henrissat et al. in the instant method since these enzymes are chemically and functionally similar as those cellulases disclosed by Van Ooyen et al. and it would have been obvious to exchange one functionally equivalent cellulase known in the prior art for another. Moreover, one of ordinary skill in the art would have been motivated to use the cellulases from T. reesei described in Henrissat et al. in the design of transgenic plants and in a method of ensilement since these cellulases have demonstrated synergistic enzymatic action in the degradation of cellulose, such synergistic action would be economically desirable.

Therefore, the invention as a whole is *prima facie* obvious over Van Ooyen et al. in view of Virki et al., Henrissat et al., and Willmitzer et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janet L Epps whose telephone number is 703-308-8883. The examiner can normally be reached on Mondays through Friday, 9:00AM to 6:00PM..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John LeGuyader can be reached on (703)-308-0447. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 for regular communications and 703-305-7939 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

jle
December 18, 2000